

# SEQUENCE LISTING

<110> CHONNAM NATIONAL UNIVERSITY et al.

<120> MUCOSAL VACCINE ADJUVANTS CONTAINING BACTERIAL FLAGELLINS AS AN ACTIVE COMPONENT

<130> Q95704

<140> US/10/585,880

<141> 2006-07-11

<150> KR 10-2004-0001974

<151> 2004-01-12

<160> 18

<170> KopatentIn 1.71

<210> 1

<211> 1131

<212> DNA

<213> *Vibrio vulnificus*

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gccgctgaag gtcaacaaaa atcaatggag cgtttgtctt cgggctataa aatcaatagc 120

gcgaaagatg atgctgcagg tctacaaatt tctaaccgtt tgaactcgca aagccgtggt 180

ctcgacatgg cggttaaaaa tgccaacgat ggtatctcta ttgcacagac tgctgaaggt 240

gcaatgacag agaccaccaa catcctacaa cgtatgcgtg accttgctt gcaatcgtct 300

aacggttcga actctcgctt tgaacgcgtg gcgattcaag aagaagtgtc agcgttgaac 360

caagaactta accgtatcgc agagacaacc tcttttggtg gtaacaaact ccttaacggg 420

acgtacgggt ctcaatcttt ccaaactcgg gctgactctg gtgaagctgt gatgctttct 480

atgggtaacc ttcgttcaga tacagacgcg atgggagggt tgagctacaa atctgaagaa 540

ggcgtaggcg cagattggcg tgtaagcgac aacactgact tcacgatgtc ttatgtgaat 600

aagcaagggt aagaaaaaga gatcacagtc aacgccaaag cgggtgacga tcttgaagaa 660

ctggcgactt acatcaacgg tcaaaacgat gatgtgaaag cgtcggtcgg tgaaggcggc 720

aaactgcagc tattcgcttc taaccaacgt gtagaagggt aagtggaatt cgggtggtgg 780

ctagcgtctg agttgaacat tggatgagg accaaaacca atgtgagcaa cattgatgtc 840

acgacgggtg ctggctctca agaagcagta gcgatcattg atggcgcat gaaatcggt 900

gacagtgagc gtgcctctct aggtgcattc caaaaccgtt tcaaccatgc aatcagcaac 960

ctaagcaaca tcaatgagaa cgtaaaccgt tgcagcagcc gtatcaagga taccgactac 1020

gcgaaagaaa cgactcagat gactaagacg caaattctgc agcaggcgag tacttctatc 1080

ctggcgcagg cgaagcagtc accatctgca gctcttagct tgttgggcta a

1131

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 <212> PRT  
 <213> Vibrio vulnificus

<400> 2  
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 1 5 10 15  
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 20 25 30  
 Ser Ser Gly Tyr Lys Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
 35 40 45  
 Gln Ile Ser Asn Arg Leu Asn Ser Gln Ser Arg Gly Leu Asp Met Ala  
 50 55 60  
 Val Lys Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Ala Glu Gly  
 65 70 75 80  
 Ala Met Thr Glu Thr Thr Asn Ile Leu Gln Arg Met Arg Asp Leu Ala  
 85 90 95  
 Leu Gln Ser Ser Asn Gly Ser Asn Ser Arg Ser Glu Arg Val Ala Ile  
 100 105 110  
 Gln Glu Glu Val Ser Ala Leu Asn Gln Glu Leu Asn Arg Ile Ala Glu  
 115 120 125  
 Thr Thr Ser Phe Gly Gly Asn Lys Leu Leu Asn Gly Thr Tyr Gly Ser  
 130 135 140  
 Gln Ser Phe Gln Ile Gly Ala Asp Ser Gly Glu Ala Val Met Leu Ser  
 145 150 155 160  
 Met Gly Asn Leu Arg Ser Asp Thr Asp Ala Met Gly Gly Leu Ser Tyr  
 165 170 175  
 Lys Ser Glu Glu Gly Val Gly Ala Asp Trp Arg Val Ser Asp Asn Thr  
 180 185 190  
 Asp Phe Thr Met Ser Tyr Val Asn Lys Gln Gly Glu Glu Lys Glu Ile  
 195 200 205  
 Thr Val Asn Ala Lys Ala Gly Asp Asp Leu Glu Glu Leu Ala Thr Tyr  
 210 215 220  
 Ile Asn Gly Gln Asn Asp Asp Val Lys Ala Ser Val Gly Glu Gly Gly  
 225 230 235 240  
 Lys Leu Gln Leu Phe Ala Ser Asn Gln Arg Val Glu Gly Glu Val Glu  
 245 250 255  
 Phe Gly Gly Gly Leu Ala Ser Glu Leu Asn Ile Gly Asp Gly Thr Lys  
 260 265 270

Thr Asn Val Ser Asn Ile Asp Val Thr Thr Val Ala Gly Ser Gln Glu  
 275 280 285  
 Ala Val Ala Ile Ile Asp Gly Ala Leu Lys Ser Val Asp Ser Glu Arg  
 290 295 300  
 Ala Ser Leu Gly Ala Phe Gln Asn Arg Phe Asn His Ala Ile Ser Asn  
 305 310 315 320  
 Leu Ser Asn Ile Asn Glu Asn Val Asn Ala Ser Ser Ser Arg Ile Lys  
 325 330 335  
 Asp Thr Asp Tyr Ala Lys Glu Thr Thr Gln Met Thr Lys Thr Gln Ile  
 340 345 350  
 Leu Gln Gln Ala Ser Thr Ser Ile Leu Ala Gln Ala Lys Gln Ser Pro  
 355 360 365  
 Ser Ala Ala Leu Ser Leu Leu Gly  
 370 375

<210> 3  
 <211> 1133  
 <212> DNA  
 <213> *Vibrio vulnificus*

<400> 3  
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 gcaaacagcg cacaacaaac ttcgatggag cgtctgtctt caggtttcaa aatcaacagt 120  
 gcaaaagatg acgcagccgg tctgcaaata tctaaccgct tgaacgtaca aagtcgcggt 180  
 ctagacgttg cggtagctaa cgccaacgac ggtatctcaa tcgcacaaac cgcagaaggt 240  
 gcgatgaacg agaccaccaa catcctacaa cgtatgcgtg acctatctct acaatccgcg 300  
 aacgggtcaa actcaaaatc agagcgcgtg gcgattcaag aagaagtgc agcattgaat 360  
 gacgagctaa accgtattgc agaaaccacg tcttttgggtg gtaacaagct gctaaacggt 420  
 acttacggca cgaaagcaat gcaaattggt gcggataacg gtgaagcggg catgctttca 480  
 ctgaaagaca tgcgctctga caacgtgatg atgggcggcg tgagctacca agctgaagaa 540  
 ggcaaagaca agaactggaa tgtggccgca ggcgacaacg acttgacgat tgcactgaca 600  
 gacagctttg gtaacgagca agagatcgaa atcaacgcga aagcgggtga tgacatcgaa 660  
 gagctagcga cgtacatcaa cgggtcaaact gaccttgtaa aagcgtcagt ggggtgaaggc 720  
 ggcaagctac agatctttgc tggtaacaac aaagttcaag gtgaaattgc tttctcaggt 780  
 agcctagctg gtgaacttgg cctaggcgaa ggcaaaaacg tcacggtaga cacgattgac 840  
 gtgacaaccg tacaaggtgc gcaagagtcg gtagcgattg tggatgcggc actgaaatac 900  
 gtagacagcc accgtgcaga gctgggtgca ttccagaacc gtttcaacca tgcaatcagc 960

aacttggaca acatcaacga aaacgtgaac gcgtcgaaga gccgaatcaa agataccgac 1020  
 ttgcgcgaaag aaacgactca gttgaccaag acacaaattc tatcgcaagc atcaagttcc 1080  
 attcttgcgc aagcgaaaca agcgccaaac tcagcgctaa gtctactagg cta 1133

<210> 4  
 <211> 375  
 <212> PRT  
 <213> *Vibrio vulnificus*

<400> 4  
 Met Ala Val Asn Val Asn Thr Asn Val Ala Ala Met Thr Ala Gln Arg  
 1 5 10 15  
 Tyr Leu Asn Asn Ala Asn Ser Ala Gln Gln Thr Ser Met Glu Arg Leu  
 20 25 30  
 Ser Ser Gly Phe Lys Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
 35 40 45  
 Gln Ile Ser Asn Arg Leu Asn Val Gln Ser Arg Gly Leu Asp Val Ala  
 50 55 60  
 Val Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Ala Glu Gly  
 65 70 75 80  
 Ala Met Asn Glu Thr Thr Asn Ile Leu Gln Arg Met Arg Asp Leu Ser  
 85 90 95  
 Leu Gln Ser Ala Asn Gly Ser Asn Ser Lys Ser Glu Arg Val Ala Ile  
 100 105 110  
 Gln Glu Glu Val Thr Ala Leu Asn Asp Glu Leu Asn Arg Ile Ala Glu  
 115 120 125  
 Thr Thr Ser Phe Gly Gly Asn Lys Leu Leu Asn Gly Thr Tyr Gly Thr  
 130 135 140  
 Lys Ala Met Gln Ile Gly Ala Asp Asn Gly Glu Ala Val Met Leu Ser  
 145 150 155 160  
 Leu Lys Asp Met Arg Ser Asp Asn Val Met Met Gly Gly Val Ser Tyr  
 165 170 175  
 Gln Ala Glu Glu Gly Lys Asp Lys Asn Trp Asn Val Ala Ala Gly Asp  
 180 185 190  
 Asn Asp Leu Thr Ile Ala Leu Thr Asp Ser Phe Gly Asn Glu Gln Glu  
 195 200 205  
 Ile Glu Ile Asn Ala Lys Ala Gly Asp Asp Ile Glu Glu Leu Ala Thr  
 210 215 220  
 Tyr Ile Asn Gly Gln Thr Asp Leu Val Lys Ala Ser Val Gly Glu Gly  
 225 230 235 240  
 Gly Lys Leu Gln Ile Phe Ala Gly Asn Asn Lys Val Gln Gly Glu Ile

| 245 |     |     |     |     |     |     |     |     |     | 250 |     |     |     |     | 255 |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| Ala | Phe | Ser | Gly | Ser | Leu | Ala | Gly | Glu | Leu | Gly | Leu | Gly | Glu | Gly | Lys |  |  |  |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |  |  |  |
| Asn | Val | Thr | Val | Asp | Thr | Ile | Asp | Val | Thr | Thr | Val | Gln | Gly | Ala | Gln |  |  |  |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |  |  |  |
| Glu | Ser | Val | Ala | Ile | Val | Asp | Ala | Ala | Leu | Lys | Tyr | Val | Asp | Ser | His |  |  |  |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |  |  |  |
| Arg | Ala | Glu | Leu | Gly | Ala | Phe | Gln | Asn | Arg | Phe | Asn | His | Ala | Ile | Ser |  |  |  |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |  |  |  |
| Asn | Leu | Asp | Asn | Ile | Asn | Glu | Asn | Val | Asn | Ala | Ser | Lys | Ser | Arg | Ile |  |  |  |  |
|     |     |     | 325 |     |     |     |     | 330 |     |     |     |     |     | 335 |     |  |  |  |  |
| Lys | Asp | Thr | Asp | Phe | Ala | Lys | Glu | Thr | Thr | Gln | Leu | Thr | Lys | Thr | Gln |  |  |  |  |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |  |  |  |
| Ile | Leu | Ser | Gln | Ala | Ser | Ser | Ser | Ile | Leu | Ala | Gln | Ala | Lys | Gln | Ala |  |  |  |  |
|     | 355 |     |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |  |  |  |
| Pro | Asn | Ser | Ala | Leu | Ser | Leu |     |     |     |     |     |     |     |     |     |  |  |  |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     |     |     |     |     |     |  |  |  |  |

<210> 5  
 <211> 1133  
 <212> DNA  
 <213> *Vibrio vulnificus*

<400> 5  
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 gcaaccgaca tgctgaatca atccttggag cgtttgtctt caggaagcg tattaatagt 120  
 gcaaaagacg atgcggcagg gctgcaaatt tcgaatcgtc ttcagtcgca aatgcgtggg 180  
 ttagatatcg cgggtgcgaaa tgccaatgat ggcatctcca ttatgcagac tgcggaaggg 240  
 gcaatgaatg aaaccactaa tattctccaa aggatgcgtg atctttcatt gcaatccgcc 300  
 aatggttcca atagctatgc tgaaagaata gccttacaag aagaaatgac cgcgttaaata 360  
 gacgagttga accgtatcgc agaaaccacc tcgttcggtg ggcgtaaaatt gctcaatggg 420  
 tcctttgggt cggctgcctt tcagataggg gcagcgtcag gtgaagcggg gcaagtgcga 480  
 ctgaagtcga tgcgcagtga tggattgat atgggtgggt tcagttacat tgcaaacgga 540  
 cgtgcccgtt ctgattggca agtaaaagag ggggcgaatg cgcttagcat gtcattcacg 600  
 aatcgttttg gtgaaacaga aacgatccaa attaatgcga aagccggcga tgatatcgaa 660  
 gagcttgca cctacattaa tggtcagact gacaaagtca cggcatcggg gaatgaagaa 720  
 ggtcagctac agttgtttat ggccggcgaa gaaacctcag gaacgttatc gttttcagga 780  
 gacttagcca gtgaactcgg ttgcaacta aaagggttac atgcggtgga taatatcgac 840

attactttctg tcggtggcgc tcaacaagca gtggctgtcc ttgataccgc gatgaaatac 900  
 gtcgatagtc atcgtgctga gctaggggca tatcaaaacc gcttcagcca tgcgattaat 960  
 aacctcgaca acatccacga aaacttggcg acatcaaaca gtcgcattca agatacagac 1020  
 tatgcgaagg aaaccacgcg catgggtcaaa caacagatcc tacagcaagt cagtacttct 1080  
 attttggcgc aggcgaaaaa agggccgaat ctcgcgttga ccttgctggg ata 1133

<210> 6  
 <211> 375  
 <212> PRT  
 <213> *Vibrio vulnificus*

<400> 6  
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 1 5 10 15  
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 20 25 30  
 Ser Ser Gly Lys Arg Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
 35 40 45  
 Gln Ile Ser Asn Arg Leu Gln Ser Gln Met Arg Gly Leu Asp Ile Ala  
 50 55 60  
 Val Arg Asn Ala Asn Asp Gly Ile Ser Ile Met Gln Thr Ala Glu Gly  
 65 70 75 80  
 Ala Met Asn Glu Thr Thr Asn Ile Leu Gln Arg Met Arg Asp Leu Ser  
 85 90 95  
 Leu Gln Ser Ala Asn Gly Ser Asn Ser Tyr Ala Glu Arg Ile Ala Leu  
 100 105 110  
 Gln Glu Glu Met Thr Ala Leu Asn Asp Glu Leu Asn Arg Ile Ala Glu  
 115 120 125  
 Thr Thr Ser Phe Gly Gly Arg Lys Leu Leu Asn Gly Ser Phe Gly Ser  
 130 135 140  
 Ala Ala Phe Gln Ile Gly Ala Ala Ser Gly Glu Ala Val Gln Val Gln  
 145 150 155 160  
 Leu Lys Ser Met Arg Ser Asp Gly Ile Asp Met Gly Gly Phe Ser Tyr  
 165 170 175  
 Ile Ala Asn Gly Arg Ala Arg Ser Asp Trp Gln Val Lys Glu Gly Ala  
 180 185 190  
 Asn Ala Leu Ser Met Ser Phe Thr Asn Arg Phe Gly Glu Thr Glu Thr  
 195 200 205  
 Ile Gln Ile Asn Ala Lys Ala Gly Asp Asp Ile Glu Glu Leu Ala Thr  
 210 215 220

Tyr Ile Asn Gly Gln Thr Asp Lys Val Thr Ala Ser Val Asn Glu Glu  
 225 230 235 240  
 Gly Gln Leu Gln Leu Phe Met Ala Gly Glu Glu Thr Ser Gly Thr Leu  
 245 250 255  
 Ser Phe Ser Gly Asp Leu Ala Ser Glu Leu Gly Leu Gln Leu Lys Gly  
 260 265 270  
 Tyr Asp Ala Val Asp Asn Ile Asp Ile Thr Ser Val Gly Gly Ala Gln  
 275 280 285  
 Gln Ala Val Ala Val Leu Asp Thr Ala Met Lys Tyr Val Asp Ser His  
 290 295 300  
 Arg Ala Glu Leu Gly Ala Tyr Gln Asn Arg Phe Ser His Ala Ile Asn  
 305 310 315 320  
 Asn Leu Asp Asn Ile His Glu Asn Leu Ala Thr Ser Asn Ser Arg Ile  
 325 330 335  
 Gln Asp Thr Asp Tyr Ala Lys Glu Thr Thr Arg Met Val Lys Gln Gln  
 340 345 350  
 Ile Leu Gln Gln Val Ser Thr Ser Ile Leu Ala Gln Ala Lys Lys Gly  
 355 360 365  
 Pro Asn Leu Ala Leu Thr Leu  
 370 375

<210> 7  
 <211> 1158  
 <212> DNA  
 <213> *Vibrio vulnificus*

<400> 7  
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 gcgacagatg agttaaacac ctcaatggaa cgtttgtcat ctggtcataa aattaatagc 120  
 gccaaagatg atgcggccgg tttgcaaatt tctaaccgct taaccgctca gtctcgtggc 180  
 ctagatgtgg cgatgcgtaa tgccaacgat ggtatctcta tcgctcaaac cgccgaaggg 240  
 gcgatgaatg aagcgacggc agtcttgcag cgcattgcgtg acttgctgat tcaatccgcg 300  
 aacggtacta actcaacgtc tgagcgccaa gcgattcatg aagaagcgag tgctctacaa 360  
 gacgaaatta accgtattgc tgaaaccaca tcgtttggtg gacgccgtct actgaatggc 420  
 acctttggtg atgcagcatt ccagattggt tctaactctg gtgaagcgat gattatgggc 480  
 ttaaccagca tccgtgccga tgatttccgt atgggtggca cgaccttcca gtctgaaaat 540  
 ggcaaaaaca aagattggga agtgagcgcg gataacgcag agctgaacat cgtattgcc 600  
 gagatgggtg aagatgaaga tggcaatggt atcgatttag aaatcaacat catggcgaaa 660  
 agcggatgat atattgaaga attggcaacg tacatcaatg gtcaatcgga ctacatcaac 720

gcatcggttaa gtgaagatgg caagctgcaa atctttgttg ctcaaccaaa tgtgaaaggc 780  
 gatattctcga tttcgggtag ccttgccctct gaactggggtt tgagtgcga accgattgcg 840  
 acaacagtag aagatttgga tctgcgtacc gtacaagggtt ctcagaacgc aattagcggtt 900  
 attgacgcgg cattgaagta cgttgattca caacgtgcgg acttaggtgc aaaacagaac 960  
 cgtttaagcc acagtattaa taacttggcg aacgttcaag aaaacgttga tgcacgaac 1020  
 agccgtatta aagatactga ttttgcaag gaaacgacgc aaatgacgaa agcacagatt 1080  
 ttgcaacagg caggtacttc tattcttgc caagcaaac aattgccaaa ctctgcaatg 1140  
 tcactattgc agggctaa 1158

<210> 8  
 <211> 383  
 <212> PRT  
 <213> *Vibrio vulnificus*

<400> 8  
 Met Ala Val Thr Val Ser Thr Asn Val Ser Ala Met Thr Ala Gln Arg  
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 Tyr Leu Asn Lys Ala Thr Asp Glu Leu Asn Thr Ser Met Glu Arg Leu  
 20 25 30  
 Ser Ser Gly His Lys Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
 35 40 45  
 Gln Ile Ser Asn Arg Leu Thr Ala Gln Ser Arg Gly Leu Asp Val Ala  
 50 55 60  
 Met Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Ala Glu Gly  
 65 70 75 80  
 Ala Met Asn Glu Ala Thr Ala Val Leu Gln Arg Met Arg Asp Leu Ser  
 85 90 95  
 Ile Gln Ser Ala Asn Gly Thr Asn Ser Thr Ser Glu Arg Gln Ala Ile  
 100 105 110  
 His Glu Glu Ala Ser Ala Leu Gln Asp Glu Ile Asn Arg Ile Ala Glu  
 115 120 125  
 Thr Thr Ser Phe Gly Gly Arg Arg Leu Leu Asn Gly Thr Phe Gly Asp  
 130 135 140  
 Ala Ala Phe Gln Ile Gly Ser Asn Ser Gly Glu Ala Met Ile Met Gly  
 145 150 155 160  
 Leu Thr Ser Ile Arg Ala Asp Asp Phe Arg Met Gly Gly Thr Thr Phe  
 165 170 175  
 Gln Ser Glu Asn Gly Lys Asn Lys Asp Trp Glu Val Ser Ala Asp Asn  
 180 185 190

9

ctcaaagaca tgcgctctga caacgtgatg atgggcggcg tgagctacca agctgaagaa 540  
 ggcaaagaca agaactggaa tgtggccgca ggcgacaacg acttgacgat tgcactgaca 600  
 gacagctttg gtaacgagca agagatcgaa atcaacgcga aagcgggcga tgacatcgaa 660  
 gagctagcga cgtacatcaa cgggtcaaact gaccttgtaa aagcgtcagt ggggtgaaggc 720  
 ggcaagctac agatctttgc tggtaacaac aaagttcaag gtgaaattgc tttctcaggt 780  
 agcctagctg gtgaacttgg cctaggcgaa ggcaaaaacg tcacggtaga cacgattgac 840  
 gtgacaaccg tacaaggtgc gcaagagtcg gtagcgattg tggatgcggc actgaaatac 900  
 gtagacagcc accgtgcaga gctgggtgca ttccagaacc gtttcaacca tgcaatcagc 960  
 aacttggaca acatcaacga gaacgtgaac gcgtcgaaga gccgaatcaa agataccgac 1020  
 ttgcgaaag aaacgactca gttgaccaag acacaaattc tatcgcaagc atcaagttcc 1080  
 attcttgcgc aagcgaaaca agcgccaaac tcagcgctaa gtctactagg ctaa 1134

<210> 10  
 <211> 377  
 <212> PRT  
 <213> *Vibrio vulnificus*

<400> 10  
 Met Ala Val Asn Val Asn Thr Asn Val Ala Ala Met Thr Ala Gln Arg  
 1 5 10 15  
 Tyr Leu Asn Asn Ala Asn Ser Ala Gln Gln Thr Ser Met Glu Arg Leu  
 20 25 30  
 Ser Ser Gly Phe Lys Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Leu  
 35 40 45  
 Gln Ile Ser Asn Arg Leu Asn Val Gln Ser Arg Gly Leu Asp Val Ala  
 50 55 60  
 Val Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Ala Glu Gly  
 65 70 75 80  
 Ala Met Asn Glu Thr Thr Asn Ile Leu Gln Arg Met Arg Asp Leu Ser  
 85 90 95  
 Leu Gln Ser Ala Asn Gly Ser Asn Ser Lys Ser Glu Arg Val Ala Ile  
 100 105 110  
 Gln Glu Glu Ile Thr Ala Leu Asn Asp Glu Leu Asn Arg Ile Ala Glu  
 115 120 125  
 Thr Thr Ser Phe Gly Gly Asn Lys Leu Leu Asn Gly Thr Tyr Gly Thr  
 130 135 140  
 Lys Ala Met Gln Ile Gly Ala Asp Asn Gly Glu Ala Val Met Leu Ser  
 145 150 155 160

Leu Lys Asp Met Arg Ser Asp Asn Val Met Met Gly Gly Val Ser Tyr  
 165 170 175  
 Gln Ala Glu Glu Gly Lys Asp Lys Asn Trp Asn Val Ala Ala Gly Asp  
 180 185 190  
 Asn Asp Leu Thr Ile Ala Leu Thr Asp Ser Phe Gly Asn Glu Gln Glu  
 195 200 205  
 Ile Glu Ile Asn Ala Lys Ala Gly Asp Asp Ile Glu Glu Leu Ala Thr  
 210 215 220  
 Tyr Ile Asn Gly Gln Thr Asp Leu Val Lys Ala Ser Val Gly Glu Gly  
 225 230 235 240  
 Gly Lys Leu Gln Ile Phe Ala Gly Asn Asn Lys Val Gln Gly Glu Ile  
 245 250 255  
 Ala Phe Ser Gly Ser Leu Ala Gly Glu Leu Gly Leu Gly Glu Gly Lys  
 260 265 270  
 Asn Val Thr Val Asp Thr Ile Asp Val Thr Thr Val Gln Gly Ala Gln  
 275 280 285  
 Glu Ser Val Ala Ile Val Asp Ala Ala Leu Lys Tyr Val Asp Ser His  
 290 295 300  
 Arg Ala Glu Leu Gly Ala Phe Gln Asn Arg Phe Asn His Ala Ile Ser  
 305 310 315 320  
 Asn Leu Asp Asn Ile Asn Glu Asn Val Asn Ala Ser Lys Ser Arg Ile  
 325 330 335  
 Lys Asp Thr Asp Phe Ala Lys Glu Thr Thr Gln Leu Thr Lys Thr Gln  
 340 345 350  
 Ile Leu Ser Gln Ala Ser Ser Ser Ile Leu Ala Gln Ala Lys Gln Ala  
 355 360 365  
 Pro Asn Ser Ala Leu Ser Leu Leu Gly  
 370 375

<210> 11  
 <211> 1127  
 <212> DNA  
 <213> *Vibrio vulnificus*

<400> 11  
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 gcaagtcagg tagctgaaac ccaaaaaaat ctaagttccg gattccgaat taatagtgcc 120  
 agcgatgatg ccgctggaat gcagatagcg aatacgcttc acgtccaaac ccgtgggtttg 180  
 gatgtggcat taactaacgc tcatagtgtt tatgtgtgtg cagaaacagc ggaaggggagc 240  
 ttggaagagg gcagtgaaat actgcagaga ttgcgatctc tttctcttca agccgcaaac 300  
 ggatcgaatt ctgatgagga tcggcaaagt ttgcagttgg aagtgggtggt attgaaagat 360

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gaagtggaaa gaatagccag gacaaccaca tttgcgggta aaaatctgtt tgatggaagt 420
tatggttcaa aaagttttca tcttggggca aattctaatt ccatttcttt gcaactcaaa 480
aacatgcgga ctcacgttcc tgagatgggc gggatatcatt accttgcctc ggagccagcg 540
gatgaggatt ggcaagttga caaggaatca aggcaactta gctttacttt tcgagatagc 600
gaaggggatg atcaatccat taagatctcg ctttaagcctg gagacagtct cgaagaagtc 660
gctacgtata tcaattcaca gcaaaatggt gtggagtcct cggtgacgga tgatcggcga 720
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gagggagagc tagactttga accgcaagga caagtgacgc tcgatgaact cgatatcagt 840
agtgtgggtg gtgctcaatt ggcgattgct gttgttgata ctgcaattca atatctggat 900
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<212> PRT
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Ser Gly Phe Arg Ile Asn Ser Ala Ser Asp Asp Ala Ala Gly Met Gln
 35          40          45

Ile Ala Asn Thr Leu His Val Gln Thr Arg Gly Leu Asp Val Ala Leu
 50          55          60

Thr Asn Ala His Ser Ala Tyr Ala Val Ala Glu Thr Ala Glu Gly Ala
 65          70          75          80

Leu Glu Glu Gly Ser Glu Ile Leu Gln Arg Leu Arg Ser Leu Ser Leu
 85          90          95

Gln Ala Ala Asn Gly Ser Asn Ser Asp Glu Asp Arg Gln Ser Leu Gln
100          105          110

Leu Glu Val Val Val Leu Lys Asp Glu Val Glu Arg Ile Ala Arg Thr
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Thr Thr Phe Ala Gly Lys Asn Leu Phe Asp Gly Ser Tyr Gly Ser Lys
130          135          140

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Ser Phe His Leu Gly Ala Asn Ser Asn Ser Ile Ser Leu Gln Leu Lys  
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 165 170 175  
 Ser Glu Pro Ala Asp Glu Asp Trp Gln Val Asp Lys Glu Ser Arg Gln  
 180 185 190  
 Leu Ser Phe Thr Phe Arg Asp Ser Glu Gly Asp Asp Gln Ser Ile Lys  
 195 200 205  
 Ile Ser Leu Lys Pro Gly Asp Ser Leu Glu Glu Val Ala Thr Tyr Ile  
 210 215 220  
 Asn Ser Gln Gln Asn Val Val Glu Ser Ser Val Thr Asp Asp Arg Arg  
 225 230 235 240  
 Leu Gln Phe Tyr Val Ala Asn Arg His Ala Pro Asp Gly Leu Asn Ile  
 245 250 255  
 Ser Gly Ser Leu Glu Gly Glu Leu Asp Phe Glu Pro Gln Gly Gln Val  
 260 265 270  
 Thr Leu Asp Glu Leu Asp Ile Ser Ser Val Gly Gly Ala Gln Leu Ala  
 275 280 285  
 Ile Ala Val Val Asp Thr Ala Ile Gln Tyr Leu Asp Ser His Arg Ser  
 290 295 300  
 Glu Ile Gly Ser Phe Gln Asn Arg Val Glu Gly Thr Met Asp Asn Leu  
 305 310 315 320  
 Gln Ser Ile Asn Arg Asn Val Thr Glu Ser Lys Gly Arg Ile Trp Asp  
 325 330 335  
 Thr Asp Phe Ala Lys Ala Ser Thr Ala Leu Val Lys Ser Gln Val Leu  
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<210> 13  
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<220>  
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<210> 16  
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<210> 17  
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 <213> *Listeria monocytogenes* flaA

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|             |            |            |            |             |            |     |
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| acagttgctg  | gttatagtgc | attatctggt | gctgatgctg | attcttctca  | agaagcaacg | 600 |
| gaagctattg  | atgaattaat | caataacatc | tctaacggtc | gtgcacttct  | aggtgctggg | 660 |
| atgagtcgcc  | ttagctacaa | tgtatctaac | gtgaacaacc | aatccatcgc  | aactaaagca | 720 |
| tctgcttcct  | ctattgaaga | tgcagatatg | gctgctgaaa | tgtccgaaat  | gactaaatac | 780 |
| aaaattctta  | cacaaacatc | tatcagcatg | ctttctcaag | caaaccaaac  | accgcaaata | 840 |
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<210> 18  
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 <212> DNA  
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| gcgaaagacg | atgcggcgag tcagggcatt gctaaccgtt ttaccgcgaa catcaaaggt 180   |
| ctgactcagg | cttcccgtaa cgctaacgac ggtatctcca ttgcgcagac cactgaaggc 240   |
| gcgctgaacg | aaatcaacaa caacctgcag cgtgtgcgtg aactggcggt tcagtctgct 300   |
| aacagcacca | actcccagtc tgacctcgac tccatccagg ctgaaatcac ccagcgctg 360    |
| aacgaaatcg | accgtgtatc cggccagact cagttcaacg gcgtgaaagt cctggcgag 420    |
| gacaacaccc | tgaccatcca ggttggtgcc aacgacggcg aaactatcga tatcgatctg 480   |
| aagcagatca | actctcagac cctgggtctg gatacgctga atgtgcaaca aaaatataag 540   |
| gtcagcgata | cggctgcaac tgttacagga tatgccgata ctacgattgc tttagacaat 600   |
| agtactttta | aagcctcggc tactgggtctt ggtgggtactg accagaaaat tgatggcgat 660 |
| ttaaaatttg | atgatacgac tggaaaatat tacgccaaag ttaccgttac ggggggaact 720   |
| ggtaaagatg | gctattatga agtttccgtt gataagacga acgggtgaggt gactcttgct 780  |
| ggcggtgcga | cttccccgct tacaggtgga ctacctgcga cagcaactga ggatgtgaaa 840   |
| aatgtacaag | ttgcaaagtc tgatttgaca gagggctaaag ccgcattgac agcagcaggt 900  |
| gttaccggca | cagcatctgt tgtaagatg tcttatactg ataataacgg taaaactatt 960    |
| gatggtgggt | tagcagttaa ggtaggcgat gattactatt ctgcaactca aaataaagat 1020  |
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